

## CIS 410/510: Project #2

Due January 19<sup>th</sup>, 2020

(which means submitted by 6am on January 20<sup>th</sup>, 2020)

Worth 5% of your grade

### Assignment:

- 1) Download skeleton file proj2.cxx and file data\_proj2.vtk and put them in a new directory.
- 2) Re-use your from CMakeLists.txt ... copy it to a new directory and rename "proj1" to be "proj2".
- 3) Compile the program and run the program. It will generate incorrect output.
- 4) You will need to implement three functions to make it generate the correct output (search for "IMPLEMENT ME!")
  - a. I would recommend you implement them in the following order:
    - i. BoundingBoxForCell
    - ii. CountNumberOfStraddlingCells
    - iii. EvaluateFieldAtLocation
- 5) Compare the output with the output I posted. Keep in mind that not all function invocations have valid arguments. GetBoundingBox returns [-100->+100, -100->+100] for invalid cell indices and EvaluateFieldAtLocation returns 0 for invalid locations.
- 6) The number of operations for BoundingBoxForCell and EvaluateFieldAtLocation should be  $O(N^{0.5})$ . Note that if 2D mesh is 101x101, then it has 100\*100 or 10000 cells. So, for  $N=10000$ ,  $O(N^{0.5})$  would mean doing 100\*C operations for some constant C.
- 7) Upload your source code when it is working.

If it does not produce the correct answer, then you should expect to get less than half credit. I would prefer to get working code late than non-working code on time.